

REMARKS

Reconsideration and allowance of the application are respectfully requested in light of the above amendments and the following remarks.

Claims 30, 51, and 52 have been amended to incorporate the features recited by claim 31. Claims 32, 33, 35, 38-40, and 44-49 have been amended to ensure proper antecedent support for each recited feature and to correct minor grammatical mistakes. Claim 31 has been cancelled without prejudice or disclaimer. Support for the amendments to claims 30, 51, and 52 is found, for example, in paragraph [0152] of the published U.S. application. (It should be noted that references herein to the specification and drawings are for illustrative purposes only and are not intended to limit the scope of the invention to the referenced embodiments.) No new matter is entered.

Claims 30-52 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Kim et al. US 7,200,789) (hereinafter, “Kim”) (it is noted that the Office Action, page 2, erroneously refers to claims 30-52 as being “unpatentable” over Kim, instead of being “anticipated” by Kim). To the extent that these rejections may be deemed applicable to the amended claims, the Applicants respectfully traverse based on the points set forth below.

Applicants’ claim 30 is directed towards a method for transmitting data packets from a mobile terminal to a base station using a hybrid automatic repeat request protocol and soft combining of received data and recites features of:

“...transmitting a data packet from the mobile terminal to the base station via a first data channel,

receiving a feedback message from the base station at the mobile terminal, wherein the feedback message indicates whether the data packet has been successfully received by the base station, and

in case the feedback message indicates that the data packet has not been received successfully, transmitting a retransmission data packet from the mobile terminal to the base station via a second data channel, wherein a transmission time interval of the first data channel is smaller than a transmission time interval of the second data channel (emphasis added)”

As emphasized above, an aspect of the method recited by Applicants’ claim 30 is using a hybrid automatic repeat request (HARQ) retransmission scheme and further using different channels for providing the initial transmission and the retransmission. Furthermore, Applicant’s claim 30 recites that the transmission time intervals on the two channels is different: in particular, a longer transmission time interval is used on the channel for the retransmissions.

Also, a second aspect of the method recited by Applicant’s claim 30 is to control the amount of information in the retransmission to a minimum level such that after soft-combining the retransmission with the initial transmission, the decoding of transmitted data becomes possible. Basically, this aspect of the invention implies that the redundancy within the retransmission is controlled such that the overall signal to noise ratio (SNR) of the combined data (or the E_b / N_T of the bits) allows successful decoding. Thus, the amount of information in the retransmission may require an increased/decreased transmission power for the retransmission, and this may have an advantageous result of significantly decreasing the interference caused by retransmissions.

It is respectfully submitted that Kim fails to disclose, either expressly or inherently, each of the features recited by Applicants’ claim 30. It is well-settled that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing

described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities." *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (emphasis added). An Office Action must provide objective evidence or cogent technical reasoning to support a conclusion of inherency. *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

By way of review, Kim discloses improvements to the HARQ protocol in a CDMA 2000 mobile communication system (see col. 1, line 30 to col. 2, line 11, discussing a CDMA 2000 system; see also col. 4, 24-62, discussing proposed improvements). The idea underlying the teachings of Kim is to adapt the traffic-to-pilot power ratio (TPR), which defines a power ratio of a reverse fundamental channel or a reverse supplemental channel transmitted by a mobile station to a pilot signal (see col. 5, lines 50-53), to the retransmission of data.

In more detail, Kim discloses an embodiment in which the mobile station initially transmits the traffic data over a supplemental channel according to a present TPR value (see step 301 in FIG. 3A or step 201 in FIG. 2; see also col. 3, lines 11 to 14 and col. 5, lines 60-62). Furthermore, in case a retransmission needs to be sent, the base station measures the E_b / N_T value of the supplemental channel and compares the measured E_b / N_T value with a target E_b / N_T value of the supplemental channel which is a predetermined threshold in an outer power loop control system. By comparing these values the base station can calculate an E_b / N_T value additionally required by the mobile station to retransmit traffic data over the supplemental channel, and can further determine at which TPR value the mobile station should transmit traffic data over the supplemental channel during the retransmission to achieve the additionally required E_b / N_T value (see col. 6, lines 22-39).

The mobile station receiving a negative acknowledgement will then transmit the retransmission using the new TPR value over the supplemental channel (see col. 6, lines 43-49; steps 304 and 305 of FIG. 3A; steps 204 and 205 of FIG. 2).

Kim also discloses another embodiment, shown in FIG. 3B, which is essentially similar to the above-described embodiment shown in FIG. 3A, except for the base station additionally calculating how many code symbols it will transmit over the supplemental channel during retransmission as well as the E_b / N_T value necessary for their retransmission. Furthermore, for an incremental redundancy (IR) scheme, the number of symbols to be transmitted over the supplemental channel or a symbol position in a position to be transmitted during retransmission is transmitted along with the negative acknowledgment signal to the mobile station (see col. 7, lines 41-55).

Kim also discloses, as described with respect to FIG. 8 in col. 8, lines 1-36, and in particular lines 20-22, that the code rate for the retransmissions is maintained:

“Therefore, although E_b / N_T received at every retransmission is increased, the code rate is maintained (emphasis added)”

As can be seen from FIG. 8, the initial transmission as well as all retransmissions for the data packet each include the same number of coded symbols, and specifically, 125 coded symbols are provided in each transmission. Therefore, Kim only controls the transmission power of the retransmissions by the means of the TPR value. In the same context, the passage in col. 8, lines 42-45 of Kim teaches that retransmissions may be retransmitted at a lower power for the retransmission than used for the initial transmission.

In contrast to the claimed subject matter, this teaching of Kim does not, however, disclose or imply that the amount of information in the retransmission is reduced. In fact, as

noted above, the amount of information depends on the code rate, which is disclosed as being constant in Kim. Thus, Kim is directed towards a substantially different method as compared to the method recited by Applicants' claim 30.

Furthermore, Kim does not disclose the feature recited by Applicants' claim 30 that the retransmission data packet is transmitted from the mobile terminal to a base station via a second data channel, i.e., a separate data channel than the data channel used for the initial transmission. As noted above, Applicants' claim 30 recites the features of "transmitting a data packet from the mobile terminal to the base station via a first data channel" and "in case the feedback message indicates that the data packet has not been received successfully, transmitting a retransmission data packet from the mobile terminal to the base station via a second data channel." In fact, Kim discloses that all transmissions (i.e., initial transmissions and retransmissions) are transmitted via the "supplemental channel", as disclosed in each and every embodiment of Kim. Although the Office Action cites to col. 3, lines 11-23 and FIG. 2 (see Office Action, pages 2-3) to reject claim 30, this cited portion of Kim simply discloses that both transmission data and retransmission data is transmitted over a single data channel, i.e., the supplemental channel 105.

Thus, Kim fails to disclose, either expressly or inherently, at least this recited feature of Applicants' claim 30, and the rejection of Applicants' claim 30 should be withdrawn for at least this reason.

Furthermore, Kim fails to disclose the feature that the transmission time interval of the first data channel is smaller than the transmission time interval of the second channel, as recited by Applicants' claim 30. As noted above, Applicants' claim 30 recites the feature of: "wherein a transmission time interval of the first data channel is smaller than a transmission time interval of the second channel." Although the Office Action (pg. 3) alleges that Kim discloses this feature

at col. 3, lines 11-20, there is absolutely no disclosure, either expressly or inherently, of this feature in Kim. Col. 3, lines 11-20 of Kim discloses the following:

“When there is data to be transmitted in a reverse direction, a mobile station (MS) initially transmits the data over a supplemental channel according to a present TPR value in step 201. Then a base station (BS) receives the initially transmitted data, and determines in step 202 whether an error has occurred in the initially transmitted data. If an error has occurred in the initially transmitted data, the base station transmits to the mobile station a NACK signal indicating occurrence of an error in step 203. The mobile station then receives the NACK signal transmitted by the base station in step 204.”

As is clear from the above quotation, col. 3, lines 11-20 of Kim does not even mention transmission time intervals. Thus, this same passage of Kim also fails to disclose the recited feature of “wherein a transmission time interval of the first data channel is smaller than a transmission time interval of the second data channel,” as recited by Applicants’ claim 30.

Accordingly, it is respectfully submitted that the rejection of Applicants’ claim 30 should be withdrawn for at least this reason as well.

Independent claims 51 and 52 recite substantially the same distinguishing features as those features described above with respect to claim 30, although claim 51 does so with respect to a mobile terminal and claim 52 does so with respect to a base station. Accordingly, it is respectfully submitted that Kim also fails to disclose, either expressly or inherently, each of the recited features of claims 51 and 52, and the rejections of Applicants’ claims 30, 51 and 52, and all claims dependent therefrom, should be withdrawn for at least the reasons set forth above.

With respect to the rejection of Applicants’ claim 32, Applicants’ claim 32 recites the features of:

“...determining a transmission power for a retransmission of the data packet, in case the feedback message indicates that the data packet has not been received successfully,

wherein the retransmission data packet is transmitted at the transmission power which is lower than a transmission power of the transmitted data packet (emphasis added)”

Although the Office Action alleges that Kim discloses this feature at FIG. 3A, 303 and 305, steps 303 and 305 of FIG. 3A and the description thereof relate to controlling and transmitting a TPR value (see col. 6, lines 40-48), but do not relate to transmitting a retransmission data packet at the transmission power which is lower than a transmission power of the transmitted data packet, as recited by Applicants’ claim 32.

Accordingly, it is respectfully submitted that the rejection of Applicants’ claim 32 should be withdrawn for at least this reason as well.

With respect to Applicants’ claim 33, Applicants’ claim 33 recites the features of:

“...further comprising subsequently reducing a transmission power for subsequent retransmission data packets that are sent for the unsuccessfully received data packet (emphasis added).”

Although the Office Action alleges that Kim discloses this recited feature at col. 7, lines 4-10, this cited portion of Kim simply summarizes the exemplary implementation of the HARQ scheme shown in FIG. 3A. However, this cited portion of Kim does not disclose reducing a transmission power for subsequent retransmission data packets, as recited by Applicants’ claim 33.

Accordingly, it is respectfully submitted that the rejection of Applicants’ claim 33 should be withdrawn for at least this reason as well.

With respect to claim 35, claim 35 recites the features of:

“...further comprising selecting in the mobile terminal a transmission power for the transmission of the retransmission data packet based on at least one of a measured channel quality, power control commands received from the base station, and an additional diversity and processing gain obtained by using the longer transmission time interval on the second data channel (emphasis added).”

Although the Office Action alleges that Kim discloses this feature at FIG. 4A, 404-407, it is apparent from the description of FIG. 4A, steps 404-407 (col. 8, line 66-col. 10, line 14) that these steps are clearly related to the operation of the base station, whereas Applicants' claim 35 is related to the operation of the mobile terminal.

Accordingly, it is respectfully submitted that the rejection of Applicants' claim 35 should be withdrawn for at least this reason as well.

With respect to Applicants' claim 37, Applicants' claim 37 recites the features of:

“...wherein the retransmission data packet is transmitted by the mobile terminal after a predetermined time span upon having received said feedback message (emphasis added).”

Applicants' claim 37 is essentially related to using a synchronous retransmission protocol, i.e., the retransmission data packet is transmitted by the mobile terminal after a predetermined time spent upon having received the feedback message, which overcomes the troublesome problem of interference as discussed in the application. Although the Office Action alleges that Kim discloses this feature at FIG. 3A, 305, there is absolutely no mention of a synchronous retransmission protocol in step 305 of FIG. 3A of Kim, the related description of step 305, or any other section of Kim. Kim does not even mention a “predetermined time span,” as recited by Applicants' claim 37.

Applicants' claim 43 also recites substantially the same feature as the above-described feature of Applicants' claim 37.

Accordingly, it is respectfully submitted that the rejection of Applicants' claim 37 and 43 should be withdrawn for at least this reason as well.

With respect to Applicants' claim 38, Applicants' claim 38 recites the features of:

“...in case the feedback message indicates that the data packet has not been received successfully, receiving a control message from the base station for the unsuccessfully received data packet, wherein the control message restricts an amount of information in the retransmission data packet to be sent,

wherein the retransmission data packet is transmitted from the mobile terminal to the base station and comprises an amount of information indicated in said control message.”

Although the Office Action alleges that Kim discloses these features at FIG. 3A, 303 and 305, the Applicants disagree with this analysis. As discussed above, the TPR value specified in col. 5, lines 50-53 of Kim is essentially defining the power ratio of a reverse fundamental channel or a reverse supplemental channel to a pilot signal (see col. 5, lines 50-53). However, Kim does not disclose restricting the amount of information in the retransmission data packet, as recited by Applicants’ claim 38, but is merely effecting the E_b / N_f for the signaled data. In fact, as disclosed by Kim in the description of FIG. 8 and as noted above, Kim discloses that the code rate of the data and thus the amount of information in all transmissions, i.e., initial transmission and all retransmission, is constant.

Accordingly, it is respectfully submitted that the rejection of Applicants’ claim 38 should be withdrawn for at least this reason as well.

With respect to Applicants’ claim 42, Applicants’ claim 42 recites the features of:

“...wherein the feedback message is transmitted via an acknowledgment channel and the control message is transmitted via a scheduling related control channel.”

Although the Office Action alleges that Kim discloses this feature at FIG. 3B, neither FIG. 3B nor the description of FIG. 3B (col. 7, lines 11-67) even mention various features recited by Applicants’ claim 42. For example, these portions of Kim fail to mention an “acknowledgement channel” or a “scheduling related control channel.” Kim does not disclose any of these features.

Accordingly, it is respectfully submitted that the rejection of Applicants' claim 42 should be withdrawn for at least this reason as well.

With respect to Applicants' claim 44, Applicants' claim 44 recites the features of:

"...wherein the control message indicates not to transmit the retransmission data packet after a predetermined time span upon having received said feedback message."

Although the Office Action alleges that Kim discloses these features at FIG. 5A, 503, step 503 of FIG. 5A is related to the transmission of a positive acknowledgment. However, Applicants' claim 44 relates to a case where the data packet is not successfully decoded, i.e., a negative acknowledgement needs to be sent. There is no teaching in Kim that there is any indication not to transmit the retransmission data packet after a predetermined time span, as recited by Applicants' claim 44.

Accordingly, it is respectfully submitted that the rejection of Applicants' claim 44 should be withdrawn for at least this reason as well.

With respect to Applicants' claim 50, Applicants' claim 50 recites the features of:

"...wherein the data packet and the retransmission data packet are transmitted via dedicated transport channels."

Although the Office Action alleges that Kim discloses this feature at FIG. 3A, neither FIG. 3A nor the description thereof, nor any other section of Kim, disclose this recited feature. As mentioned above, Kim teaches that all data, i.e., initial transmission and retransmissions, are transmitted via the same supplementary channel, as disclosed in all embodiments described in Kim.

Accordingly, it is respectfully submitted that the rejection of Applicants' claim 50 should be withdrawn for at least this reason as well.

In view of the above, it is submitted that this application is in condition for allowance and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a telephone communication, the Examiner is requested to telephone the undersigned at the local Washington, D.C. telephone number listed below.

Respectfully submitted,

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